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# The National Information Infrastructure Initiative and the Emergence of the Electronic Superhighway

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## **Introduction**

As Representative Edward J. Markey, Chairman of the House Subcommittee on Telecommunications and Finance, has been quoted as saying: "The good news from Washington is that every single person in Congress supports the concept of an information superhighway. The bad news is that no one has any idea what that means."(note 1) This bit of whimsy reflects, at best, the fact that the "information superhighway" is a label that is used by different people to apply to different developments. As a result, the information superhighway has become an umbrella concept. Labels, even umbrella labels, have their utility.

One strand of its meaning refers to our nation's communications capacity, much of which is already installed, but which is also being extended and enhanced rapidly with impressive levels of new investment. Optical fiber, which has vast capacity and two-way capability, is one of the most fashionable elements of this communications capacity. Telephone companies are laying fiber across the nation and around the world. But the major expense of laying fiber is from the curb to the home--a "last-mile" link that may cost between \$150 and \$400 billion to deploy.(note 2) Telephone companies assert that they need to participate in the video marketplace in order to compete.

But cable companies say they can provide telephone services over their wires into homes, assuming the wires are upgraded to provide greater capacity. Our established television and radio services, which already achieve universal reach with remarkable efficiency, may well be part of an existing communications highway that, with the advent of digital technologies, will have much greater capacity, including interactive capability. Still other participants, the wireless two-way communications industry--satellite, cellular, new personal communications services (PCS), and paging--make a claim for the important role that they should play in the superhighway.

On the business/industry front, events are leading toward the electronic superhighway. Industries, technologies, and services are converging--telephone with cable, computers with video services, telephony with information services, to name but a few. Reflective of these trends, individual businesses are hoping to combine, partner, and ally--including Time Warner/US West, British Telecom/MCI, and AT&T/McCaw. They say, or their advocates say, that these joint venturing activities are helping to build the superhighway.(note 3)

But the superhighway concept is also a vision and goal. Many perceive the government as having an important role in guiding, but not controlling, its development. Important legislative proposals have emerged over the past year, with the pace quickening in November 1993 and again in 1994, to eliminate some of the perceived regulatory impediments to achieving the superhighway.

At the same time, a new Administration began formulating a far-reaching communications policy and vision. President Clinton foreshadowed the breadth of interest in the National Information Infrastructure (NII) communications policy in his inaugural address: "Communications and commerce are global; investment is mobile; technology is almost magical; and ambition for a better life is now universal."(note 4) For the Administration the telecommunications superhighway is a goal that should be encouraged by government pump priming and the NII initiative, which is intended to provide a wide

encouraged by government pump priming and the NII initiative, which is intended to provide a wide range of services on a universal basis.

The purpose of this Article is to examine the blueprints of the emerging information superhighway. The first part describes how private industry has been aligning itself to construct the information superhighway. The second part explains how Congress and the Administration will help develop and regulate the information superhighway. Finally, the third part describes some of the challenges that remain in shaping the telecommunications infrastructure.

## **I. Industry's Role in Developing the Information Superhighway**

Several communications giants already have broken ground on information highways by announcing alliances with unexpected partners in order to upgrade networks, expand service offerings, and reach a broader number of consumers. These alliances have been formed, in part, because current federal and state laws limit the types of service offerings that individual communications companies can provide. For example, local telephone companies currently cannot offer video services within their service areas<sup>(note 5)</sup> and in some states, cable companies are restricted from offering telephony services.<sup>(note 6)</sup> Similarly, the Bell Operating Companies (BOCs)--the "Baby Bells" and the offspring of the AT&T divestiture--generally cannot provide interexchange service<sup>(note 7)</sup> or manufacture telecommunications equipment.<sup>(note 8)</sup> Additionally, television broadcasters cannot own or control interests in cable companies,<sup>(note 9)</sup> newspapers,<sup>(note 10)</sup> or other television stations within their service areas and can acquire only a limited number of television stations nationally.<sup>(note 11)</sup>

With appropriate competitive safeguards, new communications industry alliances may be able to enhance the quality, diversity, and level of competition for cable and telephone services, wireless communications services, and information and programming services. Some commentators, however, fear that these new alliances will monopolize the information highways, hinder the development of competition, and endanger the concept of universal service.<sup>(note 12)</sup>

### **A. Cable and Telephone Alliances**

Some of the most prominent proposed alliances to date have been between telephone and cable companies. This trend began with Southwestern Bell's \$650 million deal with Hauser Communications to acquire cable systems serving approximately 228,000 subscribers in suburban Maryland and northern Virginia.<sup>(note 13)</sup> The trend picked up momentum in May 1993, when US West and Time Warner announced that US West would acquire a 25.5 percent interest in Time Warner in exchange for a \$2.5 billion investment.<sup>(note 14)</sup> Over a five-year period, the two companies plan to spend \$5 billion to create full service networks capable of providing telephony and a wide range of other services.<sup>(note 15)</sup>

The cable-telco alliances made headlines again in October 1993, when Bell Atlantic and TCI, the nation's largest cable operator, announced the first proposed full-scale merger between telephone and cable companies.<sup>(note 16)</sup> The approximately \$30 billion deal also sparked immediate interest from lawmakers concerned about the deal's antitrust and competitive implications.<sup>(note 17)</sup> Had the deal gone through and been approved, Bell Atlantic's networks would have served over twenty-two million cable and telephone customers in fifty-nine of the top one hundred markets in the United States.<sup>(note 18)</sup> Bell Atlantic planned to upgrade these networks to provide telephony and video services. Additionally, Bell Atlantic would have gained access to TCI's vast cable programming resources, including its interests in the Discovery Channel and CNN.<sup>(note 19)</sup>

On the same day that Bell Atlantic and TCI announced their merger plans, BellSouth disclosed its intent to invest \$200 million for a 22.5 percent stake in Prime Management Co.,<sup>(note 20)</sup> a cable operator serving approximately 500,000 subscribers in Las Vegas, Houston, and Chicago.<sup>(note 21)</sup> Additionally, although it has yet to announce a cable or programming partner, Pacific Telesis has unveiled plans to invest \$16 billion to build high-powered networks in the densely populated regions of California.<sup>(note 22)</sup>

Finally, as 1993 came to a close, two more cable-telco alliances captured the public's attention. First,



Finally, as 1993 came to a close, two more cable-telco alliances captured the public's attention. First, Southwestern Bell announced its plan to acquire a 40 percent interest in Cox Cable in exchange for \$1.6 billion.(note 23) The deal, which would have formed a joint venture between the companies, did not include Cox's programming or broadcasting interests or Southwestern Bell's cable interests in the Washington, D.C., area.(note 24) Had this deal been finalized, Cox planned to use at least some of the proceeds from the deal to acquire additional cable systems.(note 25) Second, Bell Canada's parent company, BCE Telecom International, announced its plan to acquire a 30 percent interest in Jones Intercable in exchange for \$400 million.(note 26) Jones Intercable is the nation's seventh largest cable operator.(note 27) The deal has sparked concern among lawmakers about the potential for foreign control of U.S. communications operations.(note 28)

## B. Wireless Communications Alliances

While cable and telephone companies are breaking ground on wire- and fiber-based information highways, other companies are creating lanes using radio spectrum. For example, the communications giant AT&T announced its intention to acquire McCaw Cellular Communications for \$12.6 billion.(note 29) McCaw's cellular holdings cover nearly 35 percent of the U.S. population.(note 30) Assuming the deal is approved,(note 31) AT&T ultimately may try to use these cellular networks to bypass local telephone networks to the home.

Through an intense period of experimentation and development, the communications industry also has developed personal communications services, which will permit high-capacity digital voice and data transmission through small, inexpensive, hand-held, wireless telephones and computing devices.(note 32) Beginning in 1989, more than 150 companies received experimental licenses to test PCS in various forms.(note 33) Companies from virtually all sectors of the communications industry--cable television, cellular, newspaper publishing, broadcasting, and paging--have expressed a strong interest in providing PCS, which the Commission authorized in late 1993 and will license by auction in mid-1994.(note 34) The cellular industry also is converting to digital technology, primarily to compete with PCS and gain capacity in some crowded markets, and has begun implementing data transmission techniques.(note 35) Wireless data transmission also is available through specialized mobile radio (SMR) systems(note 36) and may ultimately be available through emerging mobile satellite systems.(note 37)

Five of the biggest cable companies have formed a joint venture to assist the cable industry in establishing areawide PCS, video telephony, and other advanced service networks in order to compete with local telephone companies.(note 38) These companies may use spectrum as well as fiber and wire to develop information networks.

Additionally, several companies are seeking to expand the information highways globally. For example, in June 1993, British Telecom announced its intention to acquire 20 percent of MCI for \$4.3 billion.(note 39) MCI plans to use \$2 billion of the proceeds to build local loop telephone networks in twenty of the largest cities. These local loop networks are expected to reduce the access charges paid by MCI for completing long distance telephone calls by \$300 million annually.(note 40)

Similarly, AT&T has considered partnering with two European carriers, France Telecom and Deutsche Bundespost Telekom, to create Project Atlantic, an international service aimed at European business communities and transatlantic business users.(note 41) AT&T also has aggressively searched for other global partners. Indeed in 1993, AT&T established Worldsource, its alliance with the Japanese Kokusai Denshin Denwa and Singapore Telecom.(note 42)

Finally, the broadcast industry is uniting to permit its transmission system to be part of the information superhighway. Broadcasters already reach virtually 100 percent of the U.S. population through a free, localized distribution system. The broadcast networks--both the public network, which has long been on the cutting edge of developing new technologies, and the commercial networks--have been exploring new methods to permit this distribution system to comprise part of the electronic superhighway.

Perhaps the most vital development to date has been the advent of digital, high-definition television, which has emerged from the FCC-facilitated industry effort to develop a new advanced television (ATV) standard.(note 43) The formulation of an ATV standard could permit broadcasters to transmit digitally

standard.(note 43) The formulation of an ATV standard could permit broadcasters to transmit digitally 35mm-film quality pictures and CD-quality sound as well as ancillary digital telecommunications services.(note 44)

Another development that underscores the value of broadcast transmission systems is the emergence of efforts by Warner Brothers and Paramount to create fifth and sixth television networks.(note 45) Warner Brothers' proposed television network is centered around at least six of the independent television stations licensed to the Tribune Company.(note 46) The proposed Paramount Network would be centered around Paramount's own four stations as well as six stations licensed to Chris-Craft Industries.(note 47)

## C. Cyberspace, Information Services, and Programming

The nation also has experienced the emergence and growth of cyberspace, an international web of computers and electronic information services that enables businesses, universities, and individuals instantaneously to access information and communicate electronically.(note 48) At the heart of cyberspace is the Internet, a loose confederation of computer networks with no centralized gatekeeping mechanism, but managed, to some extent, by several universities.(note 49) It was originally developed to facilitate communications among scientists and to provide a nuclear-bomb resistant mechanism for communicating security information during times of war.(note 50) It now provides communications for approximately twenty million people.(note 51)

Several companies, including Prodigy, America On-line, IBM, Apple, Microsoft, and Novell already have capitalized on the computer age by providing computer hardware, software, and information services. Additionally, several companies unexpectedly have teamed up to provide additional products. For example, Cox Enterprises and BellSouth are uniting to provide an electronic yellow page service and newspaper classified advertising service over telephone and computer networks.(note 52) NYNEX recently announced a plan to work with Prodigy to provide similar services using computer networks.(note 53)

Interestingly, Cox, BellSouth, and NYNEX all had a stake in the highly publicized battle over Paramount Communications. Both Cox and BellSouth invested in QVC Network Inc., the home-shopping network that launched a hostile attempt to acquire Paramount and failed.(note 54) NYNEX allied itself with Viacom, Inc., Paramount's friendly suitor.(note 55) The successful coalition of bidders, Viacom and NYNEX,(note 56) undoubtedly hopes to use an interest in Paramount to provide programming on their networks.

## II. The Government's Role in Developing the Information Superhighway

To help ensure that the American public will benefit from the emerging telecommunications technologies and services, Congress and the Administration are reexamining current communications and antitrust policies. The congressional initiatives, which evolved from industry developments and concerns, actually predated the Administration's announcement of its National Information Infrastructure initiative. The Administration's superhighway concept emerged later. The Administration initially provided a sense of overall context for these congressional efforts, but later developed some of its own legislative proposals.(note 57)

### A. Pending Infrastructure Legislation

The House, Senate, and Administration have proposed infrastructure legislation that agree, in principle, to enhance competition in the video programming, local exchange, long distance, manufacturing, and information service industries and to provide universal service to the American public.(note 58) Before the close of 1994, Congress may well pass some form of comprehensive infrastructure reform legislation, whether in the form of one bill that combines several pending proposals or companion bills that are coordinated with each other, although recently the legislation appears to be losing some

that are coordinated with each other, although recently the legislation appears to be losing some momentum.(note 59) Assuming that legislation ultimately is passed, for jurisdictional and other reasons, it may reflect its narrower congressional origins rather than the broader conceptional gloss that the Administration has brought to these matters.

## 1. Video Programming and Local Exchange Competition

The three infrastructure proposals would expand competition in the video programming and local exchange markets. Although the House, Senate, and Administration concur in principle on this basic regulatory concept, they diverge to some extent on how best to implement it. With respect to video services, all three generally agree that telephone companies should establish separate video programming affiliates(note 60) and be prohibited from acquiring unaffiliated in-region cable franchises.(note 61) However, they offer different alternatives for regulating cable and video dialtone systems(note 62) and establishing uniformity for digital two-way broadband switched networks.(note 63)

The House and Administration have made the video dialtone platform the centerpiece of their proposals. Although the proposals have some differences, both generally would require telephone companies with video programming affiliates to construct a video dialtone platform and to make platform capacity available to unaffiliated video programmers on a nondiscriminatory basis.(note 64) The House and Administration also would seek, to varying extents, to impose similar video platform obligations on existing cable operators.(note 65) The Senate bill, in contrast, would not require telephone companies to establish video dialtone platforms but instead would treat all telephone companies providing video programming as cable operators.(note 66)

Only the Administration proposes to add a new Title VII to the Communications Act, which would apply on an elective basis for two-way broadband, digital, switched distribution systems, regardless of whether they are owned and operated by a cable, telephone, or other type of company.(note 67) Companies could elect Title VII regulations if they provided two-way broadband, digital, switched services to at least 20 percent of their subscribers in a state.(note 68) Their regulatory obligations would include, but are not necessarily limited to, providing open access (including access for the disabled), complying with the universal service requirements, and facilitating interconnection and interoperability.(note 69) To the extent a company provides other services not meeting the Title VII criteria, they would remain regulated under Title II or Title VI of the Communications Act.(note 70)

In exchange for entering the video programming market, the House, Senate, and Administration generally would require telephone companies to provide interconnection and equal access to their networks on an unbundled basis.(note 71) All three proposals would provide relief from at least some Title II requirements for rural and small telephone companies.(note 72) The proposals also would preempt state and local governments from establishing entry barriers to the telecommunications marketplace and thus enable many cable companies to provide telephony services for the first time.(note 73) The Senate bill affirmatively would allow electric, gas, water, and steam utilities to provide telecommunications services.(note 74)

## 2. Universal Service

As Congress considers expanding competition in the cable and telephone markets, it also must address the need to provide affordable universal service to Americans so that the nation is not divided into a society of information "haves" and "have nots."(note 75) The House, Senate, and Administration would require all carriers to contribute to the preservation and advancement of universal service.(note 76) The House and Administration would establish a federal-state board to work with the FCC in achieving this goal,(note 77) while the Senate would rely on the individual states and the FCC.(note 78) The House, Senate, and Administration also seek to develop a modern definition of universal service. The Administration believes that this concept includes connecting all the nation's classrooms, libraries, hospitals, and clinics to the information highway by the year 2000.(note 79)

## 3. MFJ Restrictions

The House, Senate, and Administration generally support the elimination of the line-of-business restrictions imposed by the Modification of Final Judgment,(note 80) but have somewhat divergent views on how to regulate the entry of the Bell Operating Companies into the long distance, manufacturing, and information services markets.(note 81)

a. Long Distance Services The original House bill(note 82)--which subsequently has been approved in different versions by the Judiciary Committee and the Energy and Commerce Committee-- would permit BOCs to enter the interexchange business on a gradual basis, subject to FCC and Justice Department approval.(note 83) Specifically, it would have allowed BOCs to seek permission to provide facilities-based, in-market interstate interexchange service, following the passage of the Act,(note 84) but would have imposed eighteen-month and five-year waiting periods for applications for out-of-market resale and facilities-based interexchange services, respectively.(note 85) Applications would have been granted to the extent they satisfy the public interest and there is no substantial possibility that the BOC or its affiliates could use monopoly power to impede competition.(note 86) The original House bill would not have required BOCs to establish separate interexchange subsidiaries.

The Senate, in contrast, would demand separate interexchange affiliates,(note 87) impose no waiting periods,(note 88) and require only FCC approval after consultation with the Justice Department.(note 89) It also does not distinguish between intrastate and interstate in-market interexchange services, but establishes a stricter entry test for in-market services. In addition to the "no substantial possibility" showing, (1) the BOC must provide open access and interconnection and it must comply with the new local competition regulations;(note 90) and (2) there must be actual and demonstrable competition in the BOC's exchange and exchange-access services in each relevant market.(note 91) The standards for evaluating out-of-market applications are similar to those in the original House bill.(note 92)

b. Equipment Manufacturing The House and Senate would allow BOCs to manufacture telecommunications equipment and customer premises equipment through separate domestic affiliates.(note 93) The House would establish a one-year waiting period and require prior Justice Department approval.(note 94) The Senate would impose neither of these requirements, but would direct BOC manufacturing affiliates to submit annual audits--prepared by independent auditors selected by the individual states--to the states and the FCC.(note 95) The FCC would report to Congress on these audits every two years.(note 96)

c. Electronic Publishing The House and Senate bills both would require the creation of separate BOC affiliates for electronic publishing services.(note 97) They also would assure unaffiliated competitors access to BOC facilities, services, and basic telephone service information on the same terms and conditions as affiliated providers.(note 98)

## B. Clinton Administration Infrastructure Proposal

While the legislative proposals establish a regulatory framework for building and operating information highways, the Clinton Administration has outlined a broader conceptual plan on how the highways potentially may advance many social and economic goals such as reducing health care costs, creating new jobs, improving the educational system, and delivering more accessible and efficient governmental services. Indeed, as Vice President Gore stated, "Reforming our communications laws is only one element of the Administration's NII agenda."(note 99)

This broad conceptual plan is explained in the Administration's *The National Information Infrastructure: Agenda for Action*.(note 100) It anticipates that the NII will develop through a cooperative effort between private sector firms and the government.(note 101) Private sector firms will be primarily responsible for constructing and operating the telecommunications highways and providing computers, software, and other necessary support resources. The Administration's primary role will be to implement policies, including legislative reforms, that will spur private sector participation in the NII.(note 102) These policies will include:

(1) *promoting private sector investment* by introducing legislation that would expand competition in the cable and local telephone markets and by providing tax incentives that would encourage NII



cable and local telephone markets and by providing tax incentives that would encourage NII investment;(note 103)

(2) *ensuring true universal NII service at affordable costs* and conducting public hearings to develop a broad, modern concept of universal service so that the nation is not divided into a country of information "haves" and "have nots";(note 104)

(3) *promoting technological innovation and new applications*, particularly in the areas of education, health care, manufacturing, and the provision of government services by funding computer systems research and providing matching grants for pilot NII projects to state and local governments, health care providers, school districts, libraries, universities, and other non-profit entities;(note 105)

(4) *promoting seamless, interactive, user-driven NII operation* by working with the private sector to establish universal standards for voice, video, data, and multimedia services, and by revising regulations that impede the development of interactive services;(note 106)

(5) *ensuring information security and network reliability* by reviewing privacy concerns and encryption technologies and coordinating efforts to reduce the NII's vulnerability to sabotage, attack, accidental failure, and other catastrophes;(note 107)

(6) *improving spectrum management* by streamlining government use of spectrum in order to allocate spectrum to the public efficiently, increasing spectrum sharing, and assigning spectrum based primarily on market principles;(note 108)

(7) *protecting intellectual property rights* in NII service products by examining domestic and international copyright protections, developing mechanisms for identifying and reimbursing copyright holders, and deterring piracy;(note 109)

(8) *coordinating with international, state, and local governments* to ensure fair market access abroad for U.S. firms and to improve coordination with state and local officials, particularly with respect to regulatory policies;(note 110) and

(9) *providing access to government information and improving government procurement* by improving the mechanisms for accessing, distributing, browsing, searching, organizing, and managing government information, and by strengthening inter-agency coordination.(note 111)

To implement these broad NII policy objectives, the Administration has established the Information Infrastructure Task Force (Task Force) and the United States Advisory Council on the National Information Infrastructure (Advisory Council).(note 112) As explained below, these organizations are addressing the NII policy objectives with public and private sector input.

## 1. The Task Force

The Task Force is the primary vehicle for providing government input to the NII.(note 113) It is chaired by the Secretary of Commerce, Ronald H. Brown, and consists of senior representatives from the federal agencies who have influential roles in telecommunications and information policy matters. The Task Force works closely with Congress, the private sector, and other government agencies to address the various NII policy initiatives.(note 114)

At present the Task Force has divided the NII policy initiatives among three committees, which, in turn, have established working groups. The Telecommunications Policy Committee, which is chaired by Clarence L. Irving, the Administrator of the National Telecommunications and Information Administration and Assistant Secretary of Commerce, is examining key telecommunications issues.(note 115) This committee also has established the Universal Service Working Group, which is conducting hearings throughout the United States on universal service matters.(note 116) The committee also has an International Telecommunications Working Group to explore telecommunications issues from an international perspective(note 117) and a Network Reliability and Survivability Working Group, which will examine ways to protect the NII from sabotage and failure and safeguard the integrity and

will examine ways to protect the NII from sabotage and failure and safeguard the integrity and confidentiality of information.(note 118)

The Information Policy Committee is chaired by Sally Katzen, the Administrator of the Office of Information and Regulatory Affairs at the Office of Management and Budget (OMB).(note 119) This committee has three working groups. The Working Group on Intellectual Property Rights is chaired by Bruce Lehman, Commissioner of Patents and Trademarks.(note 120) This working group held a public hearing on November 18, 1993, and solicited public comment on a wide range of intellectual property issues.(note 121) The Working Group on Privacy is chaired by Robert Veeder of the Office of Information and Regulatory Affairs at the Office of Management and Budget.(note 122) This working group is examining how to make information accessible electronically without infringing upon individual privacy.(note 123) The Working Group on Government Information is chaired by Bruce McConnell, chief of the Information Policy Branch at OMB.(note 124) Among other things, this working group is studying the implementation of a Government Information Locator Service (GILS), which would make government information accessible electronically to the public.(note 125) In cooperation with OMB, this working group solicited public comments on a draft GILS design concept and held a public hearing on this matter.(note 126)

Finally, the Task Force has established an Applications and Technology Committee, chaired by Arati Prabhakar, the Director of the National Institute of Standards and Technology.(note 127) The committee will coordinate efforts to develop network applications for manufacturing, education, health care, government services, libraries, and other areas, and will work closely with the High-Performance Computing and Communications Program.(note 128) The Applications and Technology Committee currently has a Working Group on Government Information Technology Services, which is studying methods of improving the application of information technology by federal agencies. It also has a Technology Policy Working Group to analyze issues relating to the scalability and interoperability of networks and services.(note 129)

## **2. The Advisory Council**

Although the Task Force, its committees, and its working groups will solicit input from the public, the Administration has formed an Advisory Council to facilitate further the public's participation in the NII.(note 130) The twenty-seven member Advisory Council is chaired by Delano Lewis, President of National Public Radio, and Ed McCracken, President of Silicon Graphics.(note 131) The other Advisory Council members represent various interests, including the cable, telephone, computer, software, and broadcast industries; state and local governments; and community and consumer groups.(note 132) The Advisory Council will advise the Task Force on matters pertaining to NII development and solicit information from experts and other members of the public.(note 133)

## **III. The Twists and Turns that Lie Ahead in Constructing and Regulating the Information Superhighway**

Although both the public and private sectors have embarked on developing information superhighways, they will confront several complex and overarching issues: the role of wireless communications services and computer networks; the potential trade-offs between competition and cost; the definition and need for universal service; and the need to enhance competition in the negotiations between program suppliers and distribution system operators.

Another challenge is to develop a fair and equitable regulatory structure, which will require analysis of whether competing information distribution systems, such as cable and video dialtone systems, should be subject to the same regulatory obligations. It also will require consideration of whether the regulations should be exclusively federal and uniform or whether individual states should be able to set their own information traffic rules, speed limits, and enforcement mechanisms. While there are no easy answers to these questions, this part discusses some of the important considerations and potential trade-offs in addressing these issues.

## **A. The Role of Wireless Communications in the Information**



## A. The Role of Wireless Communications in the Information Infrastructure

Much of the debate over the information superhighway has centered around the role of fiber- and wire-based distribution systems. But several wireless communications services--with valuable and important strengths--can contribute to and enhance the nation's communications infrastructure. Indeed, Vice President Gore has recognized that "In the long run, the local loop may contain a wider set of competitors offering a broad range of interactive services, including wireless, microwave and direct broadcast satellite."(note 134)

At present, the FCC has allocated spectrum for many wireless services, including over-the-air broadcast service, direct broadcast satellite (DBS), paging, cellular, PCS,(note 135) specialized mobile radio service (SMRS),(note 136) interactive video and data service (IVDS),(note 137) multipoint distribution service (MDS) or "wireless cable" service,(note 138) location and monitoring, public safety, and aviation and marine services. Additionally, the FCC continues to propose new wireless services, including low-earth-orbit (LEO) satellite services(note 139) and the local multipoint distribution service (LMDS), which may permit integrated video, voice, and data services.(note 140)

Architects of the information highway--lawmakers and private sector leaders(note 141)--should consider how to maximize the distinct benefits of each of these wireless services. For example, how should the superhighway or national communications policy build upon the often overlooked or underestimated ability of broadcasters to provide free and universal service? Because broadcasting is both national(note 142) and local,(note 143) it is the primary source of news on a daily basis as well as in times of emergency. This service does not divide the United States into "a society of information 'haves' and 'have nots,'" (note 144) and thus meets the criteria announced by this Administration for its NII policy.

Broadcasters are also poised to enter the era of digital television, which will give them the capability to provide high definition television, as well as other innovative programming services, including interactive and highly specialized services.(note 145) The digital television era also will facilitate the convergence of both digital television and computer technologies, which will give consumers access to an even broader range of services.(note 146) The important contributions of broadcasters should not be overlooked in the information highway debate.(note 147)

Additionally, lawmakers and private sector leaders should carefully consider how to integrate, or at least take advantage of, mobile and portable wireless communications services--including cellular, PCS, paging, and SMR services--into the information superhighway. These services have the unique ability to enable people to communicate while on the move. Additionally, they should enable subscribers to access the nation's burgeoning computer networks on a remote basis. As a consequence, these wireless services can provide vital local last mile on-ramps and off-ramps for emergency medical teams, public safety crews, working parents, salespersons, business travelers, and transportation workers.

For many of these services, technologies are being developed and enhanced that will increase the data rate and decrease the size and cost of subscriber equipment. In rural areas where expensive fiber networks may be deployed more slowly, wireless services with two-way, high-speed data capabilities may be the only on-ramps and off-ramps for the information highway. Because of the strong need to serve people on the move and to reach people in rural areas, wireless services should be integrated into the national information infrastructure.

Wireless cable, DBS, and other satellite services are additional examples of wireless telecommunications resources that can enhance the information superhighway. They offer the ability to deliver multiple channels of information to the home without fiber or wire facilities or perhaps, as Vice President Gore has stated, even in competition with a fiber or wire distribution system.(note 148) One of the great challenges of the information highway era is to take advantage of the many wireless services.

## B. The Number of Fiber and/or Wire Lanes to the Home

Another fundamental question is whether there should be one or more information lanes--fiber or wire

Another fundamental question is whether there should be one or more information lanes--fiber or wire (or wireless)--into the home.(note 149) As the capabilities of cable and telephone networks converge, consumers potentially could have access to more than one wire- or fiber-based distribution system. Competition is desirable, among other reasons, because it may deter system operators from subsidizing their video programming and information service affiliates with proceeds from the distribution system.(note 150) It also will limit their ability to discriminate against competitors or charge consumers unreasonably high rates for accessing the system. Indeed, if the cost of using one fiber or wire distribution system were too expensive, service providers and consumers simply could switch to another.

Similarly, having more than one fiber or wire distribution system would provide video programmers with an alternate route to consumers. Some video programmers seek compensation for the right to distribute their program signals.(note 151) Others may pay for system access, but have an incentive to acquire this access at the lowest possible cost. Without two or more fibers or wires to the home, distribution system operators may have an unfair advantage when negotiating with programmers. For example, the 1992 Cable Act(note 152) permitted broadcasters to charge cable operators fees for the right to retransmit their broadcast signals.(note 153) However, virtually the entire cable industry refused to enter monetary agreements with broadcasters for these rights.(note 154) Instead, cable operators assumed that they could acquire these rights for free because broadcasters had no alternate route for reaching consumers by wire or fiber.(note 155) Ultimately, many broadcasters entered some form of "in-kind" agreement.(note 156) Without judging whether these outcomes were appropriate and equitable, there is a benefit to enabling broadcasters and other program suppliers to negotiate with more than one distributor in the market.

On the other hand, although a multiple wire or fiber world would enhance competition, a single fiber- or wire-based distribution system would be cheaper and might be more consistent with the goal of universal service. Recent estimates suggest that the cost of reaching every home by fiber could be as much as \$500 billion.(note 157) Even if the cost of deploying broadband fiber distribution systems could be reduced by using different types of network architectures,(note 158) it would be more expensive to deploy two overlapping systems.

Additionally, a single fiber or wire distribution system provider would not have to compete for customers in the more profitable markets. The provider, therefore, could increase its rates in these markets in order to subsidize the cost of extending the system to other less profitable markets.(note 159) Ideally, the deployment of one nationwide fiber distribution system, rather than multiple distribution systems serving only the most profitable areas, may more effectively achieve the objective of universal service. However, regulators would have to ensure that the monopolistic distributor does not use proceeds from its system to subsidize its video and information service affiliates instead of extending its network into less profitable markets.(note 160)

The one-wire/fiber versus multiple-wire/fiber debate is not necessarily bipolar, however. The Administration has signaled a willingness to consider a structure that permits a one-wire or one- fiber highway, particularly in markets that might not be able to sustain the cost of more than one wire or fiber. Such a structure, however, requires open access for service providers who wish to use the wire or fiber.(note 161) Thus, fair and effective competition would be assured, but at points in the distribution chain before and after the fiber from the curb to the home. Working out this concept in regulations and policy will be a major focus of the unfolding debate.

Another issue closely related to the one-wire/fiber versus multiple-wire/fiber debate is whether telephone companies should be allowed to acquire (rather than only to build) in-region cable systems. As noted above, the pending legislation would prohibit such acquisitions except in very small communities.(note 162) This approach means that telephone companies wishing to compete with existing cable operators would have to do so via a second wire or fiber, that is, by overbuilding.

The tension between competition and cost and the tension between choice and universal service exist now. When the Modification of Final Judgment resulted in the break-up of AT&T's monopoly, each BOC was granted a monopoly over local exchange service within its service area. As a result, the BOCs could cross- subsidize within their regions to ensure that all residents--rich and poor, urban and rural--had affordable universal telephone service.

rural--had affordable universal telephone service.

However, competitive access providers now are beginning to offer local telephone service in competition with the BOCs.(note 163) They primarily serve the highly profitable business markets and are not concerned about subsidizing service in less profitable markets. Additionally, unlike BOCs, competitive access providers do not have a substantial base of installed equipment, with high capital depreciation costs that must be included in their rate bases. If companies like MCI continued to invest billions of dollars in developing competitive access services, BOCs could potentially lose significant shares in the markets that they rely upon to subsidize universal service. In turn, telephone service may become more expensive in rural and poor areas.

On a more optimistic note, some of the newer technologies may help alleviate the tensions between competition and cost, and choice and universal service. For example, the nation could have a single fiber distribution system in competition with a less expensive wireless distribution system. Similarly, regulatory measures may address the need to provide universal service in a multi-fiber and/or wire environment.

## C. Establishing a Level Playing Field

Although both telephone and cable companies currently run wires from the curb to the home,(note 164) they traditionally provide different types of services and have different regulatory obligations.(note 165) If technologies emerge so that cable and telephone companies directly compete, it may seem appropriate that they are placed on what may objectively be perceived as a level playing field. "A level playing field" could mean that federal and state governments should impose substantially the same regulatory requirements on each competing system. In considering the possible development of a uniform regulatory structure, some of the policies that should be examined include common carrier obligations, tariff requirements, and franchise requirements.

At present, the potential need for regulatory uniformity is addressed differently by the House, the Senate, and the Administration. For example, the Senate would treat telephone companies like cable operators to the extent they provide video programming, whereas the House and the Administration would move toward a non-discriminatory video platform model. Only the Administration has proposed to add a new Title VII to the Communications Act to regulate two-way broadband, digital switched services, regardless of whether they are provided by a telephone, cable, or other type of company.(note 166) Clearly, these issues need to be resolved.

## D. Establishing the Traffic Rules, Speed Limits, and Enforcement Mechanisms

The public and private sector must also decide whether the superhighway will be policed exclusively by federal regulators or whether and to what extent state regulators will also share this responsibility. State public utilities commissions have traditionally regulated intrastate common carrier communications, while the responsibility for interstate communications has rested with the FCC.(note 167) This division of jurisdiction has reserved for the states control over matters that were truly local.

While this division of jurisdiction protects important state interests, it could potentially stymie the establishment of a universal information superhighway. As the Administration's NII initiative states, "It is crucial that all government bodies-- particularly Congress, the FCC, the Administration, and state and local governments--work cooperatively to forge regulatory principles that will promote deployment of the NII."(note 168) Indeed, if each state sets its own rates and regulatory policies, it could be difficult to establish a nationwide plan for universal service. Similarly, services that are offered simultaneously within different states may have to be tailored to comply with each individual state's regulations. As a result, distribution system operators and information service providers could lose the benefits of many important economies of scale, hindering the development of affordable universal service.

The House and Senate bills and the Administration's proposals agree that state and local entry barriers to

the telecommunications marketplace should be preempted.(note 169) The Administration would take this one step farther by generally preempting state and local regulation of any service that lacks market power.(note 170) Similarly, the Senate bill proposes to preempt states from regulating information services.(note 171) As the debate over the information highway continues to unfold, this issue of federal and state jurisdiction must be addressed.

## E. Regulating Cyberspace

Information superhighway architects must consider whether and how to regulate cyberspace, the burgeoning system of computer networks and services. The architects and regulators must decide whether to establish rules, which will prevent traffic jams and roadblocks similar to those recently experienced on the Internet.(note 172) They also must decide how to protect the privacy of network users and how to safeguard the web of computers and applications from sabotage, piracy, and attack. Although these issues are not addressed by the pending infrastructure legislation, they should be part of the NII debate.

## Conclusion

Communications services will loom even larger in the national and global economy. Indeed, many commentators believe that the efficiency of a nation's communications infrastructure may be an increasingly important determinant of its competitiveness. Therefore, the technological developments, industry and service trends, and legislative/regulatory responses described in this Article are of immense importance. Representative Markey's observation that everyone is in favor of the information superhighway should inject into the various NII initiatives the necessary will to resolve these difficult issues. In the short term, the NII initiatives will continue to highlight the differences in various parties' visions of the superhighway; in the long term, these visions may have to be reconciled by convergence, accommodation, or both.

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## Notes

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1. Anne Lindstrom, *Summit Held to Move ISDN Nationwide*, [CommunicationsWeek](#), June 7, 1993, at P3. [Return to text](#)
2. Rick Boucher, *Map to "Last Mile" of Superhighway: Let's Repeal Cross-Ownership Restriction*, [Roll Call](#), Nov. 15, 1993, Special Section, at 18, 19. [Return to text](#)
3. See Rich Brown, *Pay Per View: Driving the Superhighway*, [Broadcasting & Cable](#), Nov. 29, 1993, at 54, 56; Dawn Bushaus, *Convergence Clairvoyance*, [CommunicationsWeek](#), Feb. 7, 1994, at 3A; Mary E. Thyfault, *It's Your Call: A Second Communications Revolution Will Offer Business True Freedom of Choice*, [InformationWeek](#), Jan. 3, 1994, at 12, 13. [Return to text](#)
4. William J. Clinton, *This Is Our Time, Let Us Embrace It*, [Wash. Post](#), Jan. 21, 1993, at A26. [Return to text](#)
5. 47 U.S.C. sec. 533(b)(1) (1988); 47 C.F.R. sec. 63.54(a) (1993). However, a local telephone company may establish a video dialtone platform for the provision of video services and may acquire a very limited interest in a service provider using its platform. See 47 C.F.R. sec. 63.54(d)-(e) (1993). Bell Atlantic has successfully challenged the cable-telephone cross-

ownership limitations in federal court. *Chesapeake and Potomac Tel. Co. of Va. v. United States*, 830 F. Supp. 909 (E.D. Va. 1993), *appeal docketed*, No. 93-2340 (4th Cir. Oct. 21, 1993). Several other local exchange carriers have commenced similar lawsuits. *See, e.g., Pacific Telesis Sues to End Cable-Telco Ban*, *Comm. Daily*, Dec. 1, 1993, at 2, 3. [Return to text](#)

6. *See generally State Restrictions and Lack of Capital Help Keep Cable Out of Telco Business*, *Comm. Daily*, Nov. 16, 1993, at 3. [Return to text](#)
7. *United States v. AT&T*, 552 F. Supp. 131, 188-89 (D.D.C. 1982) (commonly referred to as the Modification of Final Judgment (MFJ)), *aff'd sub nom. Maryland v. United States*, 460 U.S. 1001 (1983). [Return to text](#)
8. *Id.* at 190-91. The interexchange and manufacturing restrictions imposed by the MFJ that ended AT&T's monopoly apply only to the BOCs. *See id.* at 188-91. The MFJ also prohibited the BOCs from providing information services, *id.* at 172-74, but this restriction was eventually lifted, *United States v. Western Elec. Co.*, 767 F. Supp. 308, 332 (D.D.C. 1991), *aff'd*, 993 F.2d 1572 (D.C. Cir.), *cert. denied sub nom. Consumers Fed'n v. United States*, 114 S. Ct. 487 (1993). [Return to text](#)
9. 47 U.S.C. sec. 533(a) (1988). [Return to text](#)
10. 47 C.F.R. sec. 73.5555(e) (1993). [Return to text](#)
11. *See* 47 C.F.R. sec. 73.3555(d)(1) (1993). [Return to text](#)
12. Fred Dawson, *Policy Becomes Critical*, *Digital Media*, Nov. 16, 1993, at 3; John Dodge, *Cable and PC Giants, RBOCs Lead the Land Rush to Digital Turf*, *PC Week*, Nov. 1, 1993, at 87, 87; Kim McAvoy, *Markey's Goal: Two Wires in Every House*, *Broadcasting & Cable*, Nov. 15, 1993, at 26, 26. [Return to text](#)
13. *See* Bloomberg Business News, *Cox in Cable Merger Talks*, *N.Y. Times*, Nov. 5, 1993, at D16; Sandra Sugawara & Paul Farhi, *Merger to Create a Media Giant*, *Wash. Post*, Oct. 14, 1993, at A1. Southwestern Bell also has acquired an interest in Cox Cable. Paul Farhi & Sandra Sugawara, *Southwestern Bell, Cox Plan Cable Partnership*, *Wash. Post*, Dec. 8, 1993, at F1. [Return to text](#)
14. Edmund L. Andrews, *From Sibling Rivalry to Civil War*, *N.Y. Times*, Nov. 28, 1993, sec. 3, at 1, 6. [Return to text](#)
15. *Id.*; Rich Brown & Harry A. Jessell, *Telco-Cable Giants Converge*, *Broadcasting & Cable*, May 24, 1993, at 6, 6. US West also has an "incentive-based option" to purchase another 8.5%. *Id.* [Return to text](#)
16. *The Cable-Phone Revolution*, *N.Y. Times*, Oct. 19, 1993, at A28. [Return to text](#)
17. Sugawara & Farhi, *supra* note 13, at A1. [Return to text](#)
18. *Bell Atlantic, TCI Forge Cable Giant Likely to Shape Interactive World*, Info. Networks, Oct. 18, 1993, available in LEXIS, News Library, Nwltrs File. Citing an uncertain regulatory climate, the parties announced that they were discontinuing merger negotiations. *Statement of Telecommunications Inc., Liberty Media Corp. and Bell Atlantic Corp.*, Business Wire, Feb. 23, 1994, available in LEXIS, News Library, Bwire File. [Return to text](#)
19. Sugawara & Farhi, *supra* note 13, at A8. [Return to text](#)
20. *Telcos' Stake Reaches 38.8%: Southwestern Bell Buys 40% of Cox Cable for \$1.6 Billion*, *Comm. Daily*, Dec. 8, 1993, at 1, 2. [Return to text](#)



21. Andrews, *From Sibling Rivalry to Civil War*, *supra* note 14, at 6; *see also Bell Atlantic, TCI Forge Cable Giant Likely to Shape Interactive World*, *supra* note 18. In addition to providing traditional cable service, Prime Management and its affiliates offer specialized services to the hotel industry. For example, the Hospitality Network, an affiliate of Prime Management's Las Vegas Community Cable System, ranks fourth among the companies that provide pay-per-view services to the hotel industry. Community Cable also uses its fiber network to provide local telephone service to hotels and other businesses, in competition with Pacific Telesis. *Another Phone Company/Cable Alliance--BellSouth and Prime*, Newsbytes News Network, Oct. 14, 1993, available in LEXIS, News Library, Nwltrs File. [Return to text](#)
22. Edmund L. Andrews, *Pactel Plans Big Project on Its Own*, *N.Y. Times*, Nov. 12, 1993, at D1, D18. AT&T will provide the equipment to Pacific Bell at a cost of \$5 billion. *This Week . . . Billion-Dollar Daze*, Common Carrier Wk., Nov. 15, 1993, available in LEXIS, News Library, Nwltrs File. [Return to text](#)
23. Farhi & Sugawara, *supra* note 13, at F4. Prior to this deal, Southwestern Bell and Cox had formed a cable and telephone venture in the United Kingdom, serving 40,000 subscribers. Charles Haddad, *Deal to Double Cox Cable's Size*, *Atlanta J. & Const.*, Dec. 8, 1993, at C1. [Return to text](#)
24. *See Telcos' Stake Reaches 38.8%*, *supra* note 20, at 2. [Return to text](#)
25. *Id.* The joint venture would have been managed by a four-person executive committee, and each company would have appointed two members. Haddad, *supra* note 23, at C2; Christopher Stern, *The Divergence of Convergence*, *Broadcasting & Cable*, Apr. 11, 1994, at 6, 6. [Return to text](#)
26. Joe Flint, *Canadian Telco Buying 30% of Jones*, *Broadcasting & Cable*, Dec. 6, 1993, at 12, 12. The terms of this deal changed following the FCC's rollback of cable rates. *Mass Media, Comm. Daily*, Mar. 29, 1994, at 6. [Return to text](#)
27. Flint, *supra* note 26, at 12. [Return to text](#)
28. *Washington Watch*, *Broadcasting & Cable*, Jan. 3, 1994, at 53, 53. [Return to text](#)
29. Edmund L. Andrews, *The A.T.&T. Deal's Big Losers*, *N.Y. Times*, Aug. 25, 1993, at D1. [Return to text](#)
30. *Id.* [Return to text](#)
31. U.S. District Judge Harold Greene ruled in April 1994 that the deal would violate the Modification of Final Judgment. AT&T is expected to file a new waiver request. *Major Setback for AT&T: Judge Greene Rules That AT&T-McCaw Merger Would Violate MFJ*, *Comm. Daily*, Apr. 6, 1994, at 1. [Return to text](#)
32. Personal communications services standards are now being considered by the Telecommunications Industry Association (TIA) TR46.3.3 Committee and Committee T1's T1P1.4 subcommittee, which have formed a joint technical committee on wireless access. Proposals for U.S. PCS standards were submitted on November 1, 1993, with at least preliminary conclusions to be reached by mid-1994. The committee anticipates a standard incorporating a 64 kilobit-per-second (kbps) data rate, near-wireline-quality voice transmission, integrated services digital network (ISDN) capability, user-friendly "roaming" between different PCS systems, and voice band data speeds of 9.6 kbps. *Vendors: Get Your PCS Air Interface Proposals in by Nov. 1*, *PCS News*, Oct. 14, 1993, available in LEXIS, News Library, Nwltrs File. [Return to text](#)
33. *See In re Amendment of the Commission's Rules to Establish New Personal Comm. Servs., Notice of Proposed Rule Making and Tentative Decision*, 7 FCC Rcd. 5676, para. 18 (1992). [Return to text](#)



34. See *In re* Amendment of the Commission's Rules to Establish New Personal Comm. Servs., *Second Report and Order*, 8 FCC Rcd. 7700 (1993) [hereinafter PCS Rules] (allocating spectrum for PCS); *In re* Implementation of sec. 309(j) of the Comm. Act, Competitive Bidding, *Notice of Proposed Rulemaking*, 8 FCC Rcd. 7635 (1993) (proposing procedures for awarding PCS and other licenses by competitive bidding). [Return to text](#)
  
35. Angela Gunn, *Connecting over Airwaves*, *PC Mag.*, Aug. 1993, at 359, 362. Cellular Digital Packet Data (CDPD) systems, which overlay networks that transmit "packets" of digitized data during pauses between voice conversations, are being implemented in several cellular markets in the United States. *Id.* at 365. CDPD is said to permit data transmission at a rate of 19.2 kbps. *Id.* at 362. IBM, McCaw Cellular Communications, Inc., and six of the seven regional Bell Operating Companies are members of a consortium to implement CDPD technology. *Id.* at 365; see also M. Wolk, *U.S. Wireless Data Markets Likely to Grow Rapidly*, Reuters European Business Rep., June 28, 1993, available in LEXIS, News Library, Wires File. [Return to text](#)
  
36. See *Motorola to Announce PCMCIA Modems for Ardis-Type Networks, Mobitex, CDPD*, Mobile Data Report, June 7, 1993, available in LEXIS, News Library, Nwltrs File. [Return to text](#)
  
37. The Commission has allocated spectrum for low- earth-orbit (LEO) satellite systems. *In re* Amendment of sec. 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed- Satellite Serv. and the Mobile-Satellite Serv. for Low-Earth Orbit Satellites, *Report and Order*, 8 FCC Rcd. 1812, para. 1 (1993). Systems below 1 GHz will focus primarily on data transmission services rather than voice services, while systems above 1 GHz will provide integrated voice and data services to remote locations. See *In re* Amendment of sec. 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed- Satellite Serv. and the Mobile-Satellite Serv. for Low-Earth Orbit Satellites, *Notice of Proposed Rule Making*, 6 FCC Rcd. 5932, para. 1 n.1 (1991).  
  
In addition, one operator has applied to the Commission for a license to provide nationwide high-speed data, telephony, and video services through a Ka-band satellite system utilizing very small aperture terminals (VSATs). See *Hughes Proposes \$660 Million Satellite System to Extend Broadband Info Highway*, *Telecomm. Rep. Wireless News*, Dec. 16, 1993, at 1. [Return to text](#)
  
38. The five cable operators are TCI, Time Warner, Continental Cable, Comcast, and Cox. Other cable operators may join the joint venture in the future. These companies also jointly own Teleport, a competitive access provider. *New Communications Services: 5 Big MSOs Form Joint Venture to Compete With Telcos*, *Comm. Daily*, Dec. 2, 1993, at 1, 1-2. [Return to text](#)
  
39. *Sprint, AT&T Want FCC to Impose Restrictions on MCI-BT Merger*, Wash. Telecom News, Oct. 11, 1993, available in LEXIS, News Library, Nwltrs File; Jennifer L. Schenker & John Blau, *AT&T Wants Equal Ground in 3-Way Deal*, *CommunicationsWeek*, Dec. 6, 1993, at 3A. [Return to text](#)
  
40. Edmund L. Andrews, *MCI Plans to Enter Local Markets*, *N.Y. Times*, Jan. 5, 1994, at D1; *Spending BT's Money: Major Local Network Project Could Save MCI \$300 Million Annually*, *Comm. Daily*, Jan. 3, 1994, at 1. [Return to text](#)
  
41. Schenker & Blau, *supra* note 39. Recent reports indicate that Project Atlantic has been abandoned. *Atlantic in Jeopardy*, *CommunicationsWeek*, Feb. 14, 1994, at 35. [Return to text](#)
  
42. *German Govt. Approves Privatization: AT&T Close to Partnership with German and French Telcos*, *Comm. Daily*, Nov. 9, 1993, at 1. [Return to text](#)
  
43. The broadcast industry--including public and commercial networks, private broadcasters, and manufacturers--has funded the Advanced Television Test Center (ATTC), which is responsible for testing ATV systems and reporting results to the Commission. Julian L. Shepard & Kurt A. Wimmer, *United States Policy Governing the Creation and Implementation of High Definition Television*, in *FCBA International Communications Practice Handbook* 31, 35 & n.21 (1991). An

Advanced Television Advisory Committee also has been created to work toward an ATV standard. *Id.* at 42. Although an initial complement of proponent systems proposed both analog and digital transmission systems, the remaining systems--which have formed a "grand alliance" to propose an ATV standard that is acceptable to all proponents--are digital. Paul E. Misener & Peter M. Fannon, *HDTV: The World in Search of a Better Picture*, in FCBA International Communications Practice Handbook 191, 201-02 (Paul J. Berman & Ellen K. Snyder eds., 1993). [Return to text](#)

44. *In re Advanced TV Sys. and Their Impact upon the Existing TV Brdcast. Serv., Memorandum Opinion and Order/Third Report and Order/Third Further Notice of Proposed Rule Making*, 7 FCC Rcd. 6924, para. 1 n.1 (1992). The Commission has decided to permit existing broadcasters to obtain a second 6 MHz channel for ATV, and has proposed to reclaim the existing NTSC channel after a period of time (most likely 15 years after ATV is implemented). *Id.* para. 2. The NTSC standard, an acronym for National Television Standards Committee, is the format currently used to transmit both color and black and white pictures over the same bandwidth. *Migration to Digital: A Long and Winding Road*, Broadcasting & Cable, Feb. 28, 1994, at S5, S5. [Return to text](#)
45. Elizabeth Kolbert, *Warner Bros. Enters Race for Network*, N.Y. Times, Nov. 3, 1993, at D1. [Return to text](#)
46. *Id.* [Return to text](#)
47. *Id.* [Return to text](#)
48. Peter H. Lewis, *Even in Cyberspace, Overcrowding*, N.Y. Times, Feb. 2, 1994, at D1. [Return to text](#)
49. *Id.*; David M. Cole, *Information Evolution: Medium May Change, But Words Remain Same*, Quill, Jan. 1994, at 20, 21-22. [Return to text](#)
50. Cole, *supra* note 49, at 21. [Return to text](#)
51. *Id.* [Return to text](#)
52. Shelly Emling, *Cox-BellSouth Advertising Venture Appears Headed for Approval by PSC*, Atlanta J. & Const., Dec. 8, 1993, at C2. [Return to text](#)
53. Joshua Mills, *So, Let Your Cursor Do the Walking*, N.Y. Times, Dec. 10, 1993, at D4. Others, including AT&T, some regional BOCs, Novell, and Microsoft, are reportedly planning to enter the market. Lewis, *supra* note 48, at C5. [Return to text](#)
54. *Viacom Assumes Control of Paramount*, UPI, Mar. 11, 1994, available in LEXIS, News Library, UPI File. [Return to text](#)
55. See generally Edmund L. Andrews, *Paramount Suitor Blasts Bell Atlantic Deal*, N.Y. Times, Oct. 27, 1993, at D9; Geraldine Fabrikant, *Newhouse and Cox Join QVC in Hostile Bid for Paramount*, N.Y. Times, Oct. 18, 1993, at A1. [Return to text](#)
56. *'They Won. We Lost. Next.': Stockholders Name Viacom Winner in Bidding for Paramount*, Comm. Daily, Feb. 16, 1994, at 3. [Return to text](#)
57. The Administration's legislative proposal is outlined in a series of White Papers and speeches. The Administration did not actually propose an infrastructure bill. [Return to text](#)
58. The House proposal consists of two bills. Representatives Edward J. Markey (D-Mass.) and Jack Fields (R-Tex.) introduced House Bill 3636, which addresses, among other things, local exchange

service, cable competition, and universal service. H.R. 3636, 103d Cong., 1st Sess. (1993). Representatives John D. Dingell (D-Mich.) and Jack Brooks (D-Tex.) introduced House Bill 3626, which addresses long distance service, manufacturing, and information services. H.R. 3626, 103d Cong., 1st Sess. (1993). Hearings and mark-ups have been held on both bills. *See Domestic Content Attacked*, *Comm. Daily*, Mar. 18, 1994, at 1, 1-2. The Administration's proposal is embodied in a White Paper, which builds on the House proposals. Administration White Paper on Communications Act Reforms 5 (Jan. 27, 1994) [hereinafter White Paper] (copy on file with the *Federal Communications Law Journal*). The Senate proposal is contained in Senate Bill 1822, 103d Cong., 2d Sess. (1994), which was introduced by Senator Ernest F. Hollings (D-S.C.) and builds and expands upon an earlier infrastructure bill, S. 1086, 103d Cong., 1st Sess. (1993), introduced in the fall by Senators John C. Danforth (R-Mo.) and Daniel K. Inouye (D-Haw.). Senate Bill 1822, *supra*, addresses, among other things, all of the major issues in the two House bills. Hearings have been held on the Senate bill. *Domestic Content Attacked*, *supra*, at 1. [Return to text](#)

59. Kim McAvoy, *Hill May Not Get to Info Highway This Year*, *Broadcasting & Cable*, Apr. 18, 1994, at 13, 13. [Return to text](#)
60. *See* S. 1822, *supra* note 58, sec. 501(b)(1)(B); H.R. 3636, *supra* note 58, sec. 652(a); White Paper, *supra* note 58, at 6. The three proposals vary to some extent on the degree and duration of separation between the telephone company and its video programming affiliate. [Return to text](#)
61. S. 1822, *supra* note 58, sec. 501(b)(1)(A)(i); H.R. 3636, *supra* note 58, sec. 656; White Paper, *supra* note 58, at 8. [Return to text](#)
62. *Compare, e.g.*, H.R. 3636, *supra* note 58, sec. 651-660 with White Paper, *supra* note 58, at 5-9. [Return to text](#)
63. *Compare, e.g.*, S. 1822, *supra* note 58, sec. 201 with White Paper, *supra* note 58, at 9-11. The Senate, House, and Administration would continue to exempt rural telephone companies from many of the new regulations. *See* S. 1822, *supra* note 58, sec. 201(a)(1); H.R. 3636, *supra* note 58, sec. 652(D)(1); White Paper, *supra* note 58, at 3. [Return to text](#)
64. H.R. 3636, *supra* note 58, sec. 654(a); White Paper, *supra* note 58, at 7-8. [Return to text](#)
65. *See* H.R. 3636, *supra* note 58, sec. 653(B); White Paper, *supra* note 58, at 8. [Return to text](#)
66. S. 1822, *supra* note 58, sec. 501(C). [Return to text](#)
67. White Paper, *supra* note 58, at 9. [Return to text](#)
68. *Id.* [Return to text](#)
69. *Id.* at 10. [Return to text](#)
70. *Id.* [Return to text](#)
71. S. 1822, *supra* note 58, sec. 230(d)(1)-(5); H.R. 3636, *supra* note 58, sec. 102(C)(1)(A); White Paper, *supra* note 58, at 10. [Return to text](#)
72. S. 1822, *supra* note 58, sec. 201(a)(1); H.R. 3636, *supra* note 58, sec. 652(D)(1); White Paper, *supra* note 58, at 3. [Return to text](#)
73. H.R. 3636, *supra* note 58, sec. 102(a)(C)(3); S. 1822, *supra* note 58, sec. 230(a); White Paper, *supra* note 58, at 3. [Return to text](#)
74. S. 1822, *supra* note 58, sec. 230(b). [Return to text](#)

75. Social science research demonstrates that a group with superior access to information gains more knowledge than other groups, thus widening the distance between social groups and increasing societal stratification. "There is certainly a class bias in attention to 'information-rich' sources and strong correlations are persistently found between social class, attention to these sources, and being able to answer information questions on political, social and economic matters." Denis McQuail, Mass Communication Theory 198 (1984); *see also* Cecilie Gaziano, *The Knowledge Gap: An Analytical Review of Media Effects*, 10 Comm. Res. 447 (1983); P.J. Tichenor et al., *Mass Media and the Differential Growth in Knowledge*, 34 Pub. Opinion Q. 159 (1970); Kurt A. Wimmer, *Deregulation and the Market Failure in Minority Programming: The Socioeconomic Dimensions of Broadcast Reform*, 8 Comm/Ent L.J. 329, 401-04 (1986). [Return to text](#)
76. *See* H.R. 3636, *supra* note 58, sec. 102(a). The Administration and the Senate would permit "in-kind" contributions. *See* S. 1822, *supra* note 58, sec. 102(a); White Paper, *supra* note 58, at 5. [Return to text](#)
77. *See* H.R. 3636, *supra* note 58, sec. 102(a); White Paper, *supra* note 58, at 5. [Return to text](#)
78. *See* S. 1822, *supra* note 58, sec. 102(a). [Return to text](#)
79. White Paper, *supra* note 58, at 4. [Return to text](#)
80. *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd sub nom. Maryland v. United States*, 460 U.S. 1001 (1983). [Return to text](#)
81. The MFJ originally prohibited BOCs from providing long distance service, manufacturing telecommunications equipment, and providing information services. A federal court has reversed the information services restriction. *See supra* note 8 and accompanying text. [Return to text](#)
82. The House bill, H.R. 3626, was marked up by the Judiciary Committee and the Energy and Commerce Committee. The two committees approved different versions of the bill. *Domestic Content Attacked*, *supra* note 58, at 1. Many commentators expect a compromise version to emerge in the near future. *Id.* at 2. [Return to text](#)
83. In-market interexchange service means that the service originates and terminates in the BOCs exchange areas or in the exchange areas of its affiliates. [Return to text](#)
84. *See* H.R. 3626, *supra* note 58, sec. 101(a). Intrastate interexchange services generally would be governed by the individual states. *See id.* sec. 107(c) (providing that, except where it would prevent operation of the Act, state law will continue to govern interexchange). [Return to text](#)
85. *See id.* sec. 101(a)(2)(B)-(C). [Return to text](#)
86. *See id.* sec. 101(b)(3)(D). [Return to text](#)
87. S. 1822, *supra* note 58, sec. 235(c)(4)(A). [Return to text](#)
88. *Id.* sec. 235(c)(4)(A)(i). [Return to text](#)
89. *Id.* sec. 235(c)(2). [Return to text](#)
90. *Id.* sec. 235(c)(2)(B). [Return to text](#)
91. *Id.* sec. 235(c)(2)(C). [Return to text](#)
92. *Compare id.* sec. 235(c)(3) with H.R. 3626, *supra* note 58, sec. 101. [Return to text](#)

93. See H.R. 3626, *supra* note 58, sec. 201; S. 1822, *supra* note 58, sec. 403. The Administration opposes the domestic manufacturing requirement. Ronald H. Brown, Secretary, U.S. Dep't of Commerce, Testimony on S. 1822 Before the Senate Comm. on Commerce, Science and Transportation, 103d Cong., 2d Sess. (Feb. 23, 1994) (transcript on file with the *Federal Communications Law Journal*). [Return to text](#)
94. See H.R. 3626, *supra* note 58, sec. 201. [Return to text](#)
95. S. 1822, *supra* note 58, sec. 402. [Return to text](#)
96. *Id.* sec. 404. The penalty for recordkeeping violations also would increase from \$6000 to \$10,000. *Id.* [Return to text](#)
97. H.R. 3626, *supra* note 58, sec. 203; S. 1822, *supra* note 58, sec. 452. [Return to text](#)
98. H.R. 3626, *supra* note 58, sec. 203; S. 1822, *supra* note 58, sec. 452. These requirements would remain in effect until June 30, 2000. H.R. 3626, *supra* note 58, sec. 203; S. 1822, *supra* note 58, sec. 452. [Return to text](#)
99. Al Gore, Remarks Prepared for Delivery by Vice President Al Gore, Royce Hall, UCLA 9 (Jan. 11, 1994) [hereinafter Gore UCLA Remarks] (transcript on file with the *Federal Communications Law Journal*). [Return to text](#)
100. See National Info. Infrastructure: Agenda for Action, *Administration Policy Statement*, 58 Fed. Reg. 49,025 (1993) [hereinafter NII Agenda for Action]. [Return to text](#)
101. *Id.* at 49,025. [Return to text](#)
102. *Id.* [Return to text](#)
103. *Id.* at 49,028. [Return to text](#)
104. *Id.* [Return to text](#)
105. *Id.* at 49,028-29. The House passed H.R. 2639, 103d Cong., 1st Sess. (1993), which would appropriate funds for NII pilot projects. *The Interactive Connection*, American Marketplace, Nov. 18, 1993, available in LEXIS, News Library, Nwltrs File. [Return to text](#)
106. NII Agenda for Action, *supra* note 100, at 49,029. [Return to text](#)
107. *Id.* [Return to text](#)
108. *Id.* at 49,030. [Return to text](#)
109. *Id.* [Return to text](#)
110. *Id.* [Return to text](#)
111. *Id.* at 49,030-31. [Return to text](#)
112. *Id.* at 49,027. [Return to text](#)
113. *Id.* at 49,035. [Return to text](#)
114. *Id.* [Return to text](#)
115. *Id.* [Return to text](#)

116. *Id.* [Return to text](#)
117. *Id.* [Return to text](#)
118. [Information Infrastructure Task Force, National Telecomm. and Info. Admin., 103d Cong., 2d Sess., Report attach. at 1 \(Mar. 10, 1994\) \[hereinafter IITF Committee Report\] \(copy on file with the \*Federal Communications Law Journal\*\)](#). [Return to text](#)
119. NII Agenda for Action, *supra* note 100, at 49,035. [Return to text](#)
120. *Id.* [Return to text](#)
121. *See* Request for Comments on Intellectual Property Issues Involved in the Nat'l Info. Infrastructure Initiative, *Notice of Hearing and Request for Public Comments*, 58 Fed. Reg. 53,917 (1993). [Return to text](#)
122. [IITF Committee Report](#), *supra* note 118, attach. at 2. [Return to text](#)
123. NII Agenda for Action, *supra* note 100, at 49,035. [Return to text](#)
124. *Id.* [Return to text](#)
125. *Id.* [Return to text](#)
126. *See* Management of Fed. Info. Resources, *Notice*, 58 Fed. Reg. 61,109 (1993). [Return to text](#)
127. NII Agenda for Action, *supra* note 100, at 49,035. [Return to text](#)
128. *Id.* [Return to text](#)
129. [IITF Committee Report](#), *supra* note 118, at 3-4. [Return to text](#)
130. *See* NII Agenda for Action, *supra* note 100, at 49,035. [Return to text](#)
131. Ronald H. Brown, Secretary, Dep't of Commerce, Remarks at the Museum of Television and Radio 3 (Jan. 6, 1994) (transcript on file with the *Federal Communications Law Journal*). [Return to text](#)
132. *Id.* [Return to text](#)
133. *See* NII Agenda for Action, *supra* note 100, at 49,035. [Return to text](#)
134. Gore UCLA Remarks, *supra* note 99, at 6. [Return to text](#)
135. *See* PCS Rules, *supra* note 34. [Return to text](#)
136. *See In re* An Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz, *Second Report and Order*, 46 F.C.C.2d 752 (1974), *modified on recon.*, 51 F.C.C.2d 945 (1975), *aff'd as modified sub nom.* National Ass'n of Reg. Util. Comm'rs v. FCC, 525 F.2d 630 (D.C. Cir.), *cert. denied*, 425 U.S. 992 (1976); *see also In re* Request of Fleet Call, Inc. for Waiver and Other Relief to Permit Creation of Enhanced Specialized Mobile Radio Sys. in Six Mkts., *Memorandum Opinion and Order*, 6 FCC Rcd. 1533, *recon. dismissed*, 6 FCC Rcd. 6989 (1991). [Return to text](#)
137. *See In re* Amendment of Pts. 0, 1, 2, and 95 of the Commission's Rules to Provide for Interactive Video Data Servs., *Report and Order*, 7 FCC Rcd. 1630, *modified on recon.*, *Memorandum Opinion and Order*, 7 FCC Rcd. 4923 (1992), *modified on recon.*, *Second Report and Order*, 8



FCC Rcd. 2787 (1993). [Return to text](#)

138. See 47 C.F.R. secs. 21.900-.914 (1993). [Return to text](#)
139. See *In re* Amendment of sec. 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Serv. and the Mobile-Satellite Serv. for Low-Earth Orbit Satellites, *Report and Order*, 8 FCC Rcd. 1812 (1993). [Return to text](#)
140. The FCC has proposed implementing LMDS in the 28 GHz band, a portion of the spectrum that until recently was considered unusable except for point-to-point microwave and satellite transmissions. LMDS systems would utilize cellular-style base stations throughout a community to provide multichannel video, data transmission, and voice telephony. The FCC has proposed allocating 1000 MHz to each of two licensees in an LMDS service area, which would constitute the largest single spectrum allocation to a single user in the history of the FCC. See *In re* Rulemaking to Amend Pt. 1 and Pt. 21 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Serv., *Notice of Proposed Rulemaking, Order, Tentative Decision and Order on Reconsideration*, 8 FCC Rcd. 557, paras. 5, 20 (1993). [Return to text](#)
141. Private sector leaders include, but are not necessarily limited to, representatives from industry, academia, labor, and public interest and nonprofit organizations. NII Agenda for Action, *supra* note 100, at 49,036. [Return to text](#)
142. Indeed, it was over-the-air broadcasting that kept the nation informed over 30 years ago when President John F. Kennedy was assassinated and more recently during the Persian Gulf War and the bombing of the World Trade Center. [Return to text](#)
143. Over-the-air broadcasters regularly offer local programming and provide vital and timely information concerning inclement weather, traffic, and other local events. [Return to text](#)
144. Broadcasters Caucus, Broadcasters Caucus White Paper on Digital Television Technology and the NII 3 (Dec. 13, 1993) (copy on file with the *Federal Communications Law Journal*); Vice President Al Gore, Remarks at the National Press Club 8 (Dec. 21, 1993) [hereinafter Gore Press Remarks] (transcript on file with the *Federal Communications Law Journal*). [Return to text](#)
145. Broadcasters Caucus, *supra* note 144, at 3-4; Gore Press Remarks, *supra* note 144, at 6. [Return to text](#)
146. Broadcasters Caucus, *supra* note 144, at 4-6; Gore Press Remarks, *supra* note 144, at 4. [Return to text](#)
147. Broadcasters Caucus, *supra* note 144, at 3-4; Gore Press Remarks, *supra* note 144, at 6. [Return to text](#)
148. Gore Press Remarks, *supra* note 144, at 6. [Return to text](#)
149. Although the analysis in this section is framed in terms of one or more wires or fibers to the home, this function could be served by wireless systems as well. [Return to text](#)
150. Assuming that Congress enacts legislation allowing telephone companies to offer in-region video services, telephone companies presumably will be required to do so through separate affiliates. While this should help deter unlawful cross- subsidization, competition will provide additional safeguards. [Return to text](#)
151. The most recent example occurred after passage of the 1992 Cable Act. Major broadcasters had intense negotiations for retransmission rights. See generally Steve McClellan, *Retrans Plans: Programming the New Channels*, *Broadcasting & Cable*, Oct. 11, 1993, at 16. [Return to text](#)

152. Cable Television Consumer Protection and Competition Act of 1992, Pub. L. No. 102-385, 106 Stat. 1460 (codified in scattered sections of 47 U.S.C.A. secs. 521-611 (West Supp. 1994)).  
[Return to text](#)
153. 47 U.S.C.A. sec. 535(i)(2) (West Supp. 1994). [Return to text](#)
154. *See* McClellan, *supra* note 151, at 16. [Return to text](#)
155. *Id.* [Return to text](#)
156. *Id.* [Return to text](#)
157. *Government Urges ISDN Deployment Ahead of Broadband*, ISDN News, Dec. 15, 1993, available in LEXIS, News Library, Curnws File. [Return to text](#)
158. Fred Dawson, *Telcos Find New Routes; Regional Bell Holding Companies Develop Broadband Communications*, *Digital Media*, Oct. 21, 1993, at 6. The star network architecture, commonly used by telephone companies, requires relatively long fiber links to the home. *Id.* A bus architecture or ring architecture could expand the size of the switch and reduce the amount of fiber needed to reach the home. *See id.*; Richard Karpinski, *U.S. West Forges Ahead with Fiber/Coax Vision*, *Telephony*, Feb. 8, 1993, at 7, 8. [Return to text](#)
159. In a competitive environment, distribution system operators will want to deploy fiber networks in the more profitable markets, where they presumably can reach more homes with relatively little fiber, and consumers will have the financial resources to subscribe to multiple system services. Indeed, they would have little incentive to extend the expensive system to rural areas where substantially more fiber is needed to serve fewer people. Similarly, there would be little incentive to build out to poorer areas because residents could not afford to purchase many video and information services. As a consequence, having multiple fiber or wire highways could divide the United States into a society of information "haves" and "have nots." [Return to text](#)
160. *See 2 Wires into Home: Competition, Electronic Highways, Free TV, Violence Key Issues at Conference*, *Comm. Daily*, Nov. 10, 1993, at 1, 2. With one fiber or wire distribution system, customer subscription fees should be lower since the cost of constructing and maintaining the system could be shared by a larger customer base. Also, the public would not have to subscribe to multiple distribution systems in order to have a full complement of services. [Return to text](#)
161. This structure presently exists in rural areas where telephone companies are permitted to own or operate cable companies within their service areas. 47 U.S.C. sec. 533 (b)(3) (1988); 47 C.F.R. sec. 63.58 (1993); *see also* 47 U.S.C. sec. 533(b)(4) (1988) (permitting cable-telco cross-ownership in more populous areas if cable service could not otherwise exist). [Return to text](#)
162. S. 1822, *supra* note 58, sec. 201(a)(1); H.R. 3636, *supra* note 58, sec. 652(D)(1); White Paper, *supra* note 58, at 3. [Return to text](#)
163. *MCI Is Betting on Local-Loop Investment*, *CommunicationsWeek*, Jan. 24, 1994, at 3A. [Return to text](#)
164. Unlike cable, telephone service is virtually universal. Ninety-eight percent of U.S. households own a television set. Gregory Cerio & Lucy Howard, *Tale of the Tube*, *Newsweek*, Aug. 2, 1993, at 6, 6. It is estimated that 60% of U.S. households owning televisions subscribe to cable. *H.R. Conf. Rep. No. 862*, 102d Cong., 2d Sess. 56 (1992), *reprinted in* 1992 U.S.C.C.A.N. 1231, 1238. In contrast, 93% of all U.S. households have telephone service. Sandra Sugawara, *Firm Urges FCC to Alter Phone Policy, 'Universal Service' Revision Proposed*, *Wash. Post*, Nov. 2, 1993, at C4. [Return to text](#)

165. Local telephone companies are regulated as common carriers by the FCC and state public utilities commissions. Additionally, they are required to file tariffs and cannot deny subscribers network access on the basis of the content of their communications. *See generally* 47 U.S.C. secs. 152, 202-203 (1988). In contrast, cable companies provide one-way video service on a non-common carrier basis. Cable companies are regulated by the FCC and local franchising authorities. As a general matter, they are not required to file tariffs. 47 U.S.C. sec. 541 (1988). [Return to text](#)
166. *See supra* part II.A.1. [Return to text](#)
167. *See* 47 U.S.C. sec. 152 (1988). [Return to text](#)
168. NII Agenda for Action, *supra* note 100, at 49,030. [Return to text](#)
169. H.R. 3626, *supra* note 58, sec. 107; S. 1822, *supra* note 58, sec. 230(a); White Paper, *supra* note 58, at 3. [Return to text](#)
170. White Paper, *supra* note 58, at 3. [Return to text](#)
171. S. 1822, *supra* note 58, sec. 234(c). [Return to text](#)
172. Lewis, *supra* note 48. [Return to text](#)